

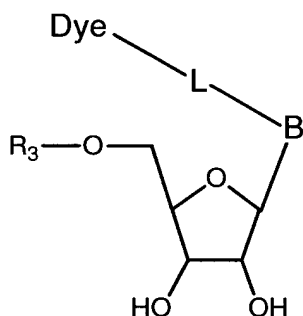
## **AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions and listings of claims in the application:

1-100. (cancelled)

101. (previously presented) A method for determining a polynucleotide sequence, comprising

- (i) annealing at least one primer to a template polynucleotide;
- (ii) extending said at least one primer in the presence of a mixture of at least four unlabeled dNTPs and at least one dye-labeled ribonucleotide having the formula:



wherein B is a nucleobase; L is a linker; R<sub>3</sub> is triphosphate,  $\alpha$ -thiotriphosphate, or a salt thereof, and Dye is a reporter group;

so that primer extension products that contain at least one dye-labeled ribonucleotide are formed;

(iii) cleaving one or more primer extension products to form a plurality of labeled fragments;

(iv) separating the extension products by size; and

(v) detecting the fragments to determine the polynucleotide sequence.

102. (original) The method according to claim 101, wherein the dye-labeled ribonucleotides are rATP-PA-6R6G, rCTP-PA-Rox, rUTP-PA-Tamra and rGTP-EO-R110.

103. (original) The method according to claim 101, wherein one primer is biotinylated.

104. (original) The method according to claim 101, wherein at least one primer is a hybridization based pull-out primer.

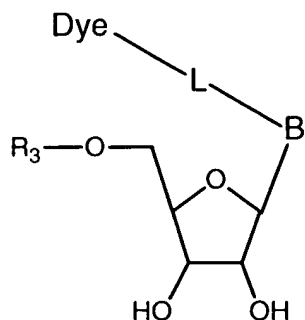
105. (original) The method according to claim 101, wherein the DNA polymerase is a thermostable DNA polymerase.

106. (original) The method according to claim 105, wherein the thermostable DNA polymerase is a modified thermostable DNA polymerase having increased efficiency for the incorporation of ribonucleotides.

107. (previously presented) The method according to claim 101, wherein said one or more primer extension products are cleaved at each occurrence of a ribonucleotide by alkali treatment, heat treatment, or a ribonuclease.

108. (previously presented) A method for detecting mutations in a polynucleotide, comprising

- annealing two primers to a template polynucleotide;
- extending the two primers in the presence of a mixture of at least four unlabeled dNTPs and at least one dye-labeled ribonucleotide having the formula:



wherein B is a nucleobase; L is a linker; R<sub>3</sub> is triphosphate, α-

thiotriphosphate, or a salt thereof, and Dye is a reporter group;

so that primer extension products that contain at least one dye-labeled ribonucleotide are formed;

- cleaving one or more primer extension products to form a plurality of labeled fragments;

- separating the fragments by size; and

- detecting the fragments to detect the mutations.

109. (previously presented) The method according to claim 108, wherein the fragments that contain primers are separated from other fragments before the fragments that contain primers are separated by size.

110. (original) The method according to claim 108, wherein the mutation is a single nucleotide polymorphism.

111. (previously presented) The method according to claim 108, wherein the polynucleotide is genomic DNA.

112. (original) The method according to claim 108, wherein at least one primer is biotinylated.

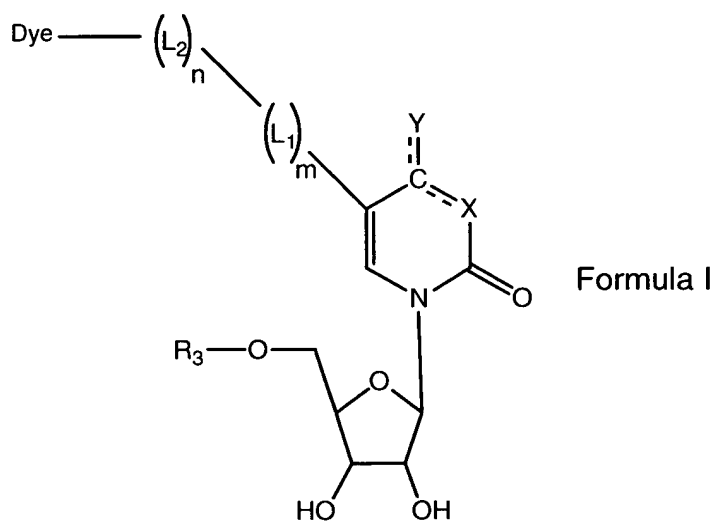
113. (currently amended) The method according to claim 108, wherein at least one primer is a hybridization based pull-out primer.

114. (original) The method according to claim 108, wherein one primer comprises a modified base preventing primer extension in the 5' direction.

115-123. (cancelled)

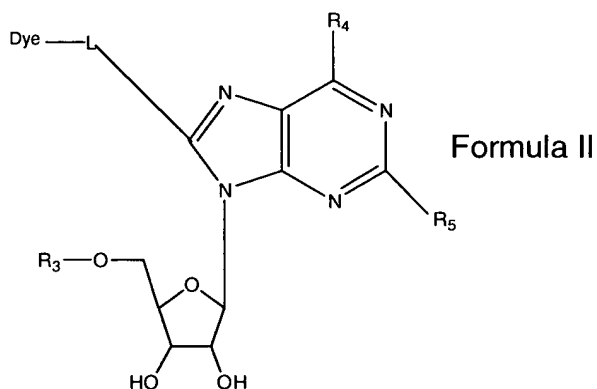
124. (previously presented) The method according to claim 101, wherein said at least one dye-labeled ribonucleotide is:

(1) a compound of formula I:



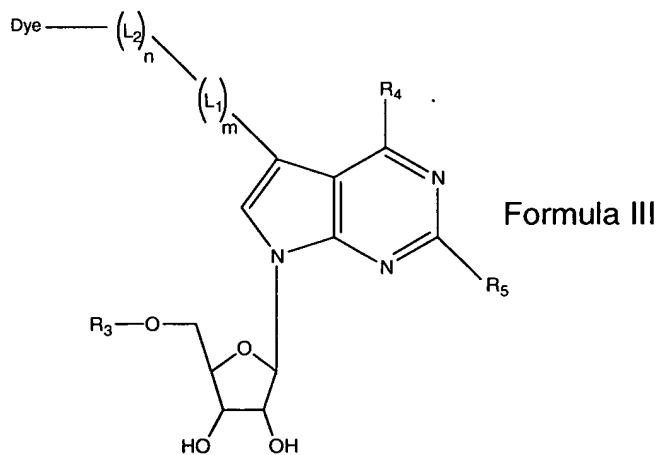
- wherein  $X$  is  $N$ ,  $NH$ , or  $C$ ;
- wherein  $Y$  is  $O$  or  $NH_2$ ;
- wherein  $R_3$  is either triphosphate,  $\alpha$ -thiotriphosphate, or a salt thereof;
- wherein  $L_1$  is a linker;
- wherein  $L_2$  is a benzylamine linker or a phosphate linker;
- wherein  $n = 0-4$ ,  $m = 0-4$ , and  $m + n$  is at least 1; and  $[[;]]$
- wherein the dye is any reporter group;

(2) a compound of formula II:



- wherein L is a linker;
- wherein R<sub>4</sub> is either NH<sub>2</sub>, OH, or O, and B is either NH<sub>2</sub>, OH, or H;
- wherein R<sub>3</sub> is either triphosphate, α-thiotriphosphate, or a salt thereof;  
and
- wherein the dye is any reporter group;

(3) a compound of formula III:

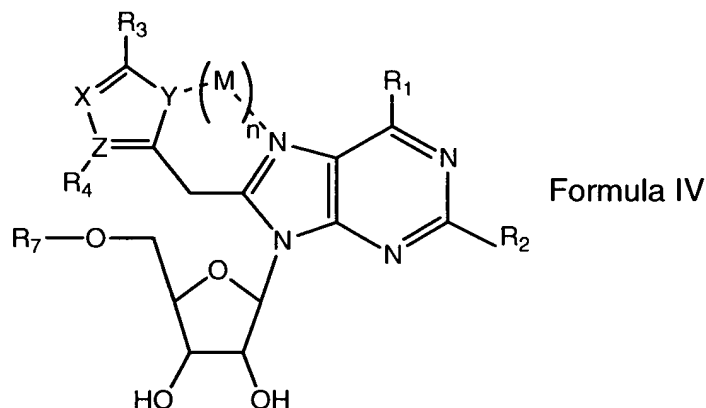


- wherein L<sub>1</sub> is a linker;
- wherein L<sub>2</sub> is a benzylamine linker or a phosphate linker;
- wherein n = 0-4, m = 0-4, and m + n is at least 1;
- wherein R<sub>4</sub> is either NH<sub>2</sub>, OH, or O, and R<sub>5</sub> is either NH<sub>2</sub>, OH, or H;

- wherein  $R_3$  is either triphosphate,  $\alpha$ -thiotriphosphate, or a salt thereof;  
and

- wherein the dye is any reporter group;

(4) a compound of formula IV:



- wherein  $R_1$ ,  $R_2$ , and  $R_4$  are independently H, O, OR, S, SR,  $NR_2$  or  $CR_2$ ;

- wherein  $R_3$  is SR,  $NR_2$ , OR, or  $CR_2$  and comprises a reporter group;

- wherein R is hydrogen, alkyl, aryl, or an amino acid;

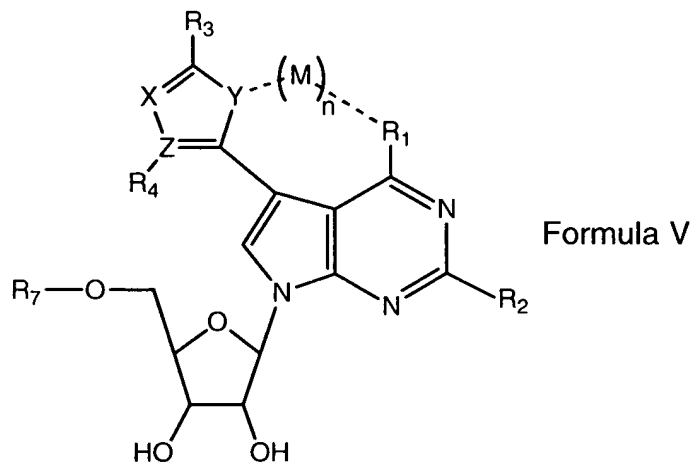
- wherein  $R_7$  is either triphosphate,  $\alpha$ -thiotriphosphate, or a salt thereof;

- wherein X, Y, and Z are independently carbon, nitrogen, oxygen, sulfur,  
phosphorus, or selenium;

- wherein n is 0 or 1; and

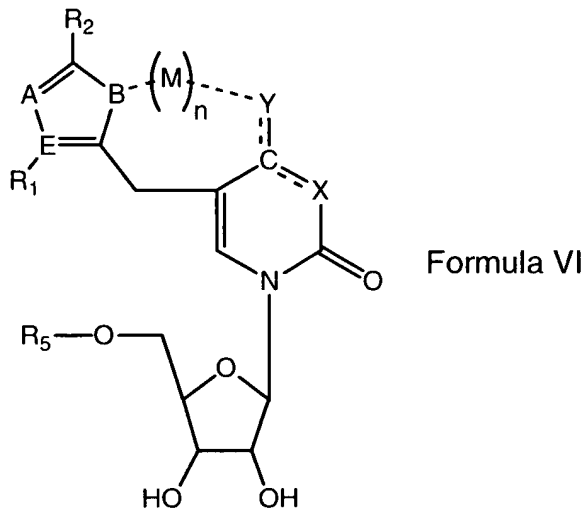
- wherein M is  $H_2O$  or any metal;

(5) a compound of formula V:



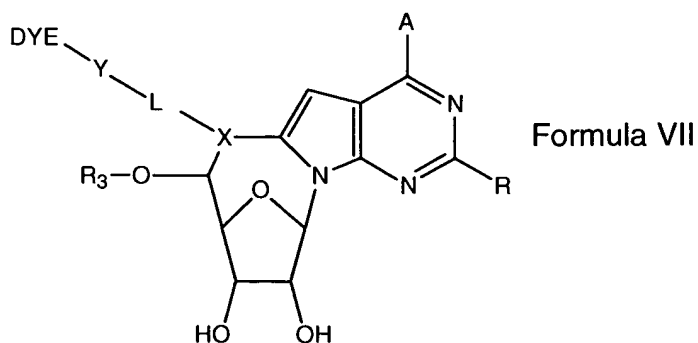
- wherein  $R_1$ ,  $R_2$ , and  $R_4$  are independently H, O, OR, S, SR,  $NR_2$  or  $CR_2$ ;
- wherein  $R_3$  is SR,  $NR_2$ , OR, or  $CR_2$  and comprises a reporter group;
- wherein R is hydrogen, alkyl, aryl, or an amino acid;
- wherein  $R_7$  is either triphosphate,  $\alpha$ -thiotriphosphate, or a salt thereof;
- wherein X, Y, and Z are independently carbon, nitrogen, oxygen, sulfur, phosphorus, or selenium;
- wherein n is 0 or 1; and
- wherein M is  $H_2O$  or any metal;

(6) a compound of formula VI:



- wherein  $R_1$  is H, O, OR, S, SR,  $NR_2$ , or  $CR_2$ ,
- wherein  $R_2$  is SR,  $NR_2$ , OR, or  $CR_2$  and comprises a reporter group;
- wherein R is hydrogen, alkyl, alkynyl, aryl, or an amino acid;
- wherein  $R_5$  is either triphosphate,  $\alpha$ -thiotriphosphate, or a salt thereof;
- wherein X is N, NH, or C;
- wherein Y is O or  $NH_2$ ;
- wherein A, B, and E are independently C, N, O, S, P, or Se;
- wherein n is 0 or 1; and
- wherein M is  $H_2O$  or any metal;

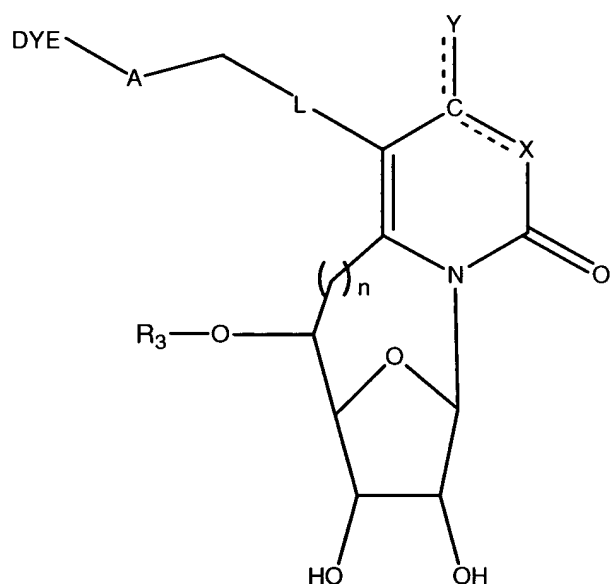
(7) a compound of formula VII:





- wherein A is NH<sub>2</sub>, OH, or O;
- wherein R is H, O, NR'<sub>2</sub>, S, CR'<sub>2</sub>, or halide;
- wherein R' is hydrogen or alkyl;
- wherein R<sub>3</sub> is either triphosphate, α-thiotriphosphate, or a salt thereof;
- wherein L is alkyl;
- wherein X is CR or N and Y is O, S, or NH; and
- wherein the dye is any reporter group;

(8) a compound of formula VIII:

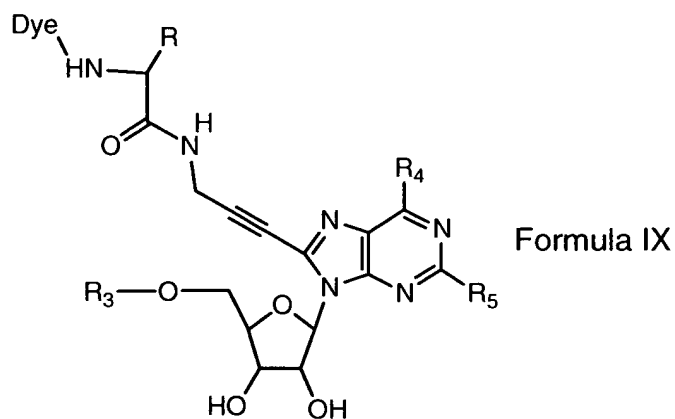


Formula VIII

- wherein X is N, NH, or C;
- wherein Y is O or NH<sub>2</sub>;
- wherein R<sub>3</sub> is either triphosphate, α-thiotriphosphate, or a salt thereof;
- wherein A is O, S, or NH;
- wherein L is alkyl or aryl substituted at from 0 to 3 positions in a chemically reasonable manner with F, Cl, Br, I, C1-C18 alkyl, Silyl, OH, OR', SH, SR', SOR', SO<sub>2</sub>R', SO<sub>3</sub>, or NR'<sub>2</sub>;
- wherein R' is hydrogen or alkyl;

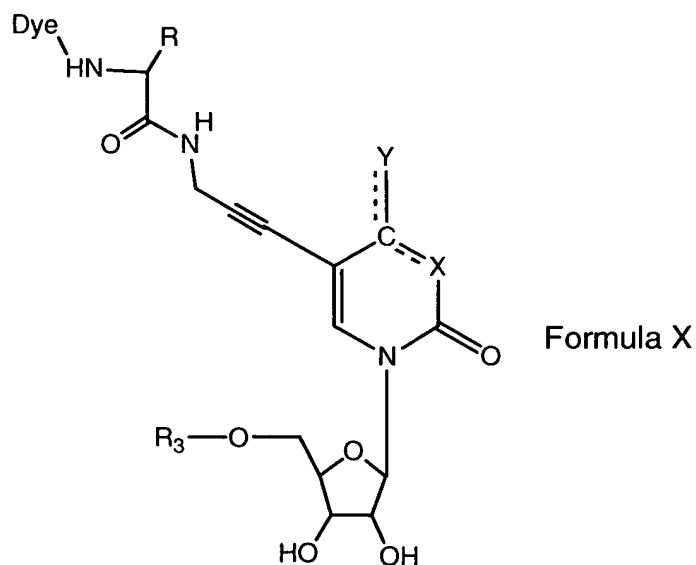
- wherein n is 1 to 10; and
- wherein the dye is any reporter group;

(9) a compound of formula IX:



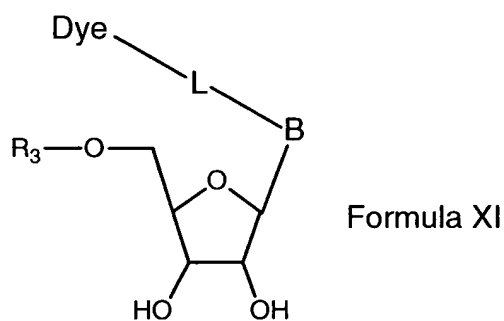
- wherein  $R_4$  is  $NH_2$ ,  $OH$ , or  $O$  and  $R_5$  is  $NH_2$ ,  $OH$ , or  $H$ , provided that if  $A$  is  $NH_2$ ,  $B$  is  $H$  and if  $A$  is  $O$ ,  $B$  is  $NH_2$ ;
- wherein  $R_3$  is either triphosphate,  $\alpha$ -thiotriphosphate, or a salt thereof;
- wherein the dye is any reporter group; and
- wherein  $R$  is a side chain for mobility tuning;

(10) a compound of formula X:



- wherein X is N, NH, or C;
- wherein Y is O or NH<sub>2</sub>;
- wherein R<sub>3</sub> is either triphosphate, α-thiotriphosphate, or a salt thereof;
- wherein Dye is any reporter group, and
- wherein R is a side chain for mobility tuning; or

(11) a compound of formula XI:



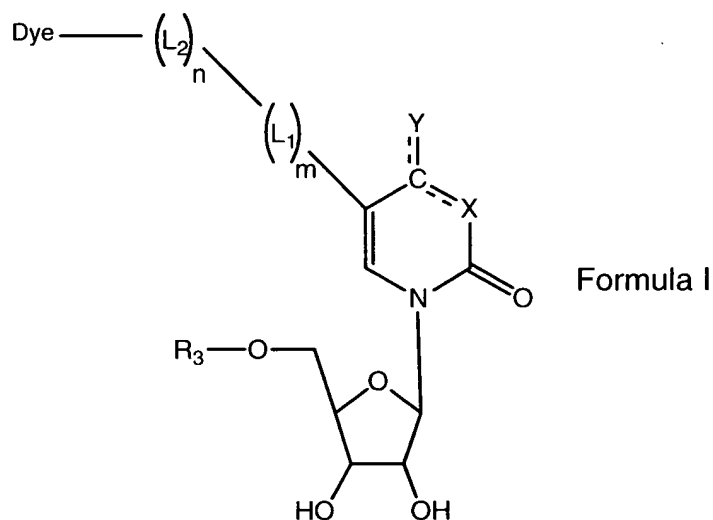
- wherein B is a nucleobase selected from uracil, cytosine, adenine, 7-deazaadenine, guanine, and 7-deazaguanine;
- wherein R<sub>3</sub> is triphosphate or a salt thereof;
- wherein L is a linker selected from propargyl-ethyl-oxide-amino and propargylamino wherein the linker is attached to the 8-C of a adenine, 7-deazaadenine, guanine, or 7-deazaguanine nucleobase, the 7-C or 8-C of a 7-deazaadenine or 7-deazaguanine nucleobase, or the C-5 of a uracil or cytosine nucleobase; and
- wherein Dye is selected from a rhodamine dye and a fluorescein dye.

125. (previously presented) The method according to claim 101, wherein the reporter group is a rhodamine-type dye, a fluorescein-type dye, an energy transfer dye, or a cyanine-type dye.

126. (previously presented) The method according to claim 101, further comprising separating the fragments that contain at least one primer from other fragments.

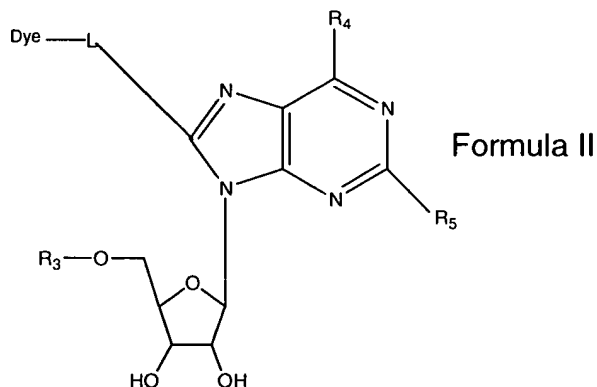
127. (previously presented) The method according to claim 108, wherein said at least one dye-labeled ribonucleotide is:

(1) a compound of formula I:



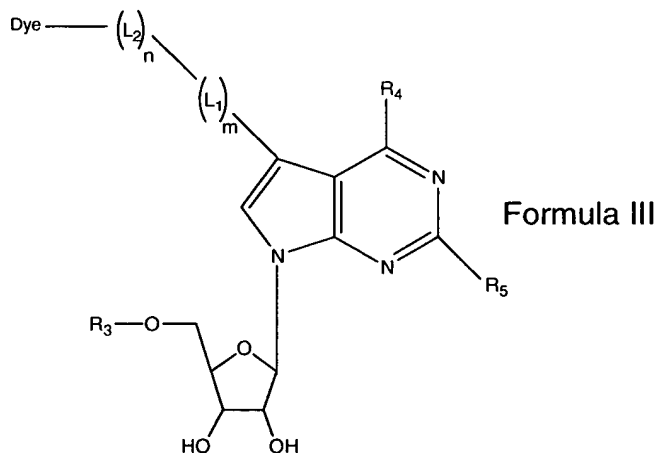
- wherein X is N, NH, or C;
- wherein Y is O or NH<sub>2</sub>;
- wherein R<sub>3</sub> is either triphosphate, α-thiotriphosphate, or a salt thereof;
- wherein L<sub>1</sub> is a linker;
- wherein L<sub>2</sub> is a benzylamine linker or a phosphate linker;
- wherein n = 0-4, m = 0-4, and m + n is at least 1; and [[:]]
- wherein the dye is any reporter group;

(2) a compound of formula II:



- wherein L is a linker;
- wherein R<sub>4</sub> is either NH<sub>2</sub>, OH, or O, and B is either NH<sub>2</sub>, OH, or H;
- wherein R<sub>3</sub> is either triphosphate, α-thiotriphosphate, or a salt thereof;  
and
- wherein the dye is any reporter group;

(3) a compound of formula III:

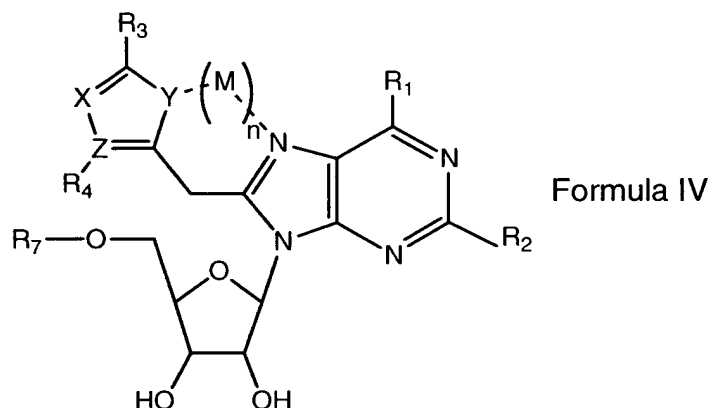


- wherein L<sub>1</sub> is a linker;
- wherein L<sub>2</sub> is a benzylamine linker or a phosphate linker;
- wherein n = 0-4, m = 0-4, and m + n is at least 1;
- wherein R<sub>4</sub> is either NH<sub>2</sub>, OH, or O, and R<sub>5</sub> is either NH<sub>2</sub>, OH, or H;

- wherein  $R_3$  is either triphosphate,  $\alpha$ -thiotriphosphate, or a salt thereof;  
and

- wherein the dye is any reporter group;

(4) a compound of formula IV:



- wherein  $R_1$ ,  $R_2$ , and  $R_4$  are independently H, O, OR, S, SR,  $NR_2$  or  $CR_2$ ;

- wherein  $R_3$  is SR,  $NR_2$ , OR, or  $CR_2$  and comprises a reporter group;

- wherein R is hydrogen, alkyl, aryl, or an amino acid;

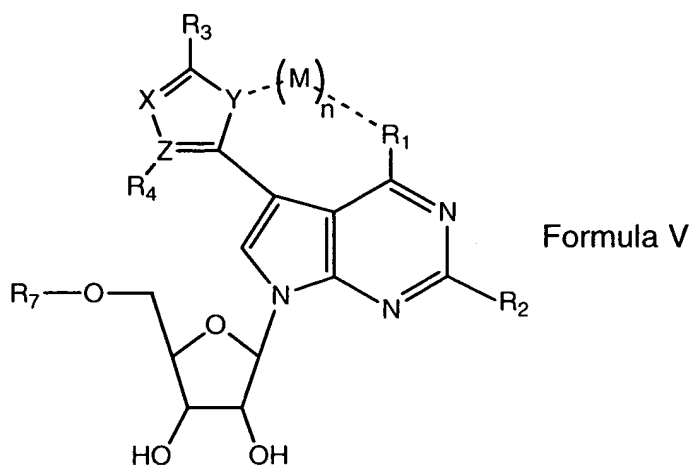
- wherein  $R_7$  is either triphosphate,  $\alpha$ -thiotriphosphate, or a salt thereof;

- wherein X, Y, and Z are independently carbon, nitrogen, oxygen, sulfur,  
phosphorus, or selenium;

- wherein n is 0 or 1; and

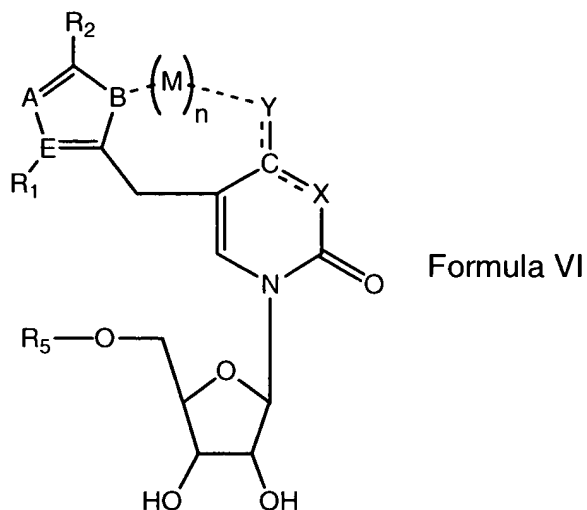
- wherein M is  $H_2O$  or any metal;

(5) a compound of formula V:



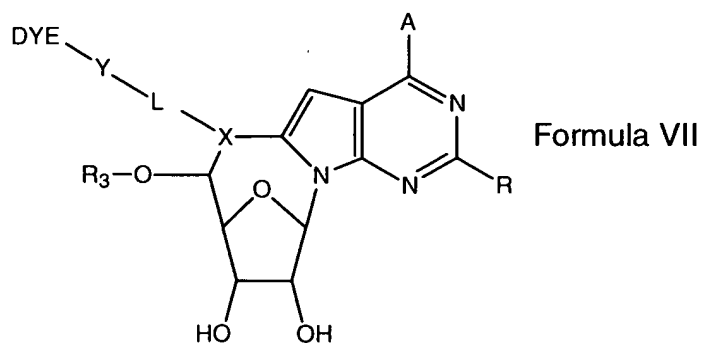
- wherein R<sub>1</sub>, R<sub>2</sub>, and R<sub>4</sub> are independently H, O, OR, S, SR, NR<sub>2</sub> or CR<sub>2</sub>;
- wherein R<sub>3</sub> is SR, NR<sub>2</sub>, OR, or CR<sub>2</sub> and comprises a reporter group;
- wherein R is hydrogen, alkyl, aryl, or an amino acid;
- wherein R<sub>7</sub> is either triphosphate, α-thiotriphosphate, or a salt thereof;
- wherein X, Y, and Z are independently carbon, nitrogen, oxygen, sulfur, phosphorus, or selenium;
- wherein n is 0 or 1; and
- wherein M is H<sub>2</sub>O or any metal;

(6) a compound of formula VI:



- wherein  $R_1$  is H, O, OR, S, SR,  $NR_2$ , or  $CR_2$ ,
- wherein  $R_2$  is SR,  $NR_2$ , OR, or  $CR_2$  and comprises a reporter group;
- wherein R is hydrogen, alkyl, alkynyl, aryl, or an amino acid;
- wherein  $R_5$  is either triphosphate,  $\alpha$ -thiotriphosphate, or a salt thereof;
- wherein X is N, NH, or C;
- wherein Y is O or  $NH_2$ ;
- wherein A, B, and E are independently C, N, O, S, P, or Se;
- wherein n is 0 or 1; and
- wherein M is  $H_2O$  or any metal;

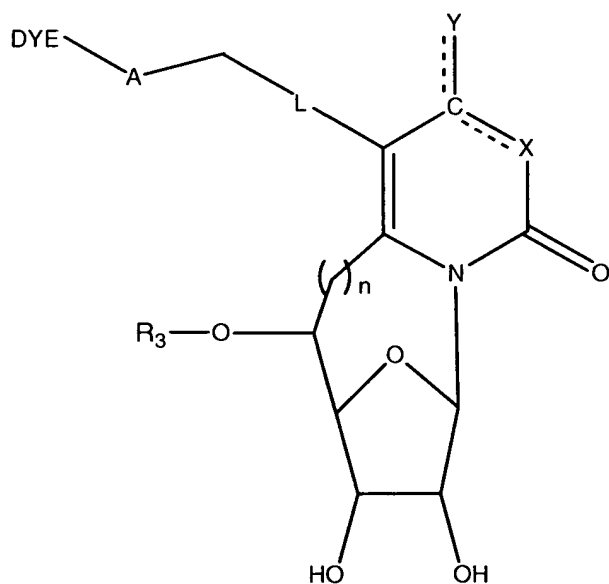
(7) a compound of formula VII:





- wherein A is  $\text{NH}_2$ , OH, or O;
- wherein R is H, O,  $\text{NR}'_2$ , S,  $\text{CR}'_2$ , or halide;
- wherein R' is hydrogen or alkyl;
- wherein  $\text{R}_3$  is either triphosphate,  $\alpha$ -thiotriphosphate, or a salt thereof;
- wherein L is alkyl;
- wherein X is CR or N and Y is O, S, or NH; and
- wherein the dye is any reporter group;

(8) a compound of formula VIII:

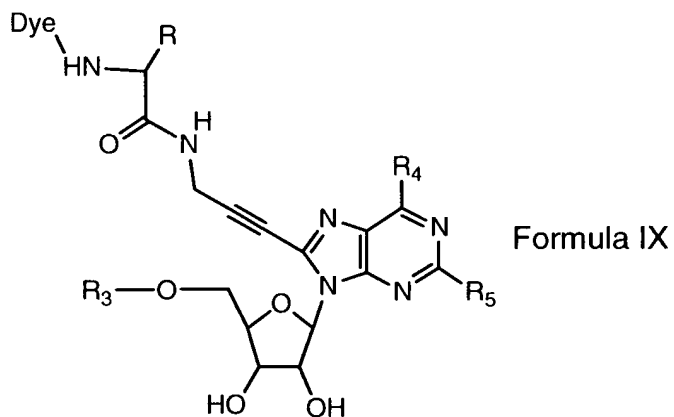


Formula VIII

- wherein X is N, NH, or C;
- wherein Y is O or  $\text{NH}_2$ ;
- wherein  $\text{R}_3$  is either triphosphate,  $\alpha$ -thiotriphosphate, or a salt thereof;
- wherein A is O, S, or NH;
- wherein L is alkyl or aryl substituted at from 0 to 3 positions in a chemically reasonable manner with F, Cl, Br, I, C1-C18 alkyl, Silyl, OH, OR', SH, SR', SOR',  $\text{SO}_2\text{R}'$ ,  $\text{SO}_3$ , or  $\text{NR}'_2$ ;
- wherein R' is hydrogen or alkyl;

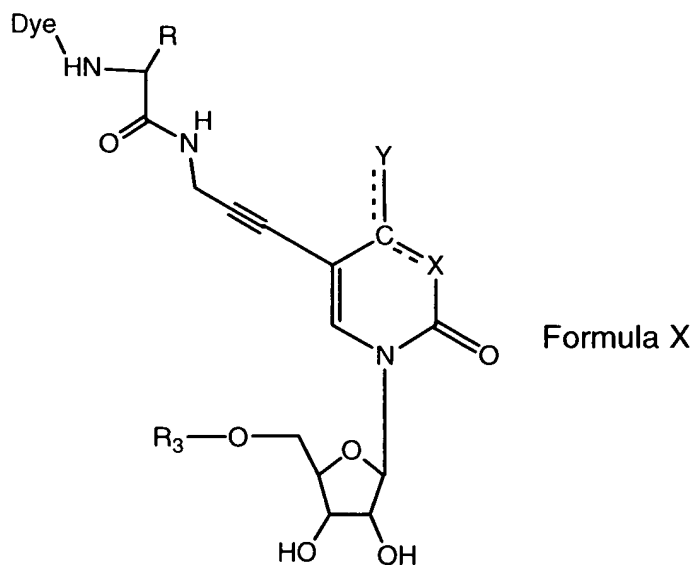
- wherein n is 1 to 10; and
- wherein the dye is any reporter group;

(9) a compound of formula IX:



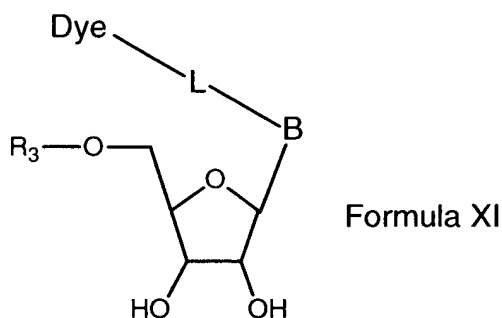
- wherein R<sub>4</sub> is NH<sub>2</sub>, OH, or O and R<sub>5</sub> is NH<sub>2</sub>, OH, or H, provided that if A is NH<sub>2</sub>, B is H and if A is O, B is NH<sub>2</sub>;
- wherein R<sub>3</sub> is either triphosphate, α-thiotriphosphate, or a salt thereof;
- wherein the dye is any reporter group; and
- wherein R is a side chain for mobility tuning;

(10) a compound of formula X:



- wherein X is N, NH, or C;
- wherein Y is O or NH<sub>2</sub>;
- wherein R<sub>3</sub> is either triphosphate, α-thiotriphosphate, or a salt thereof;
- wherein Dye is any reporter group, and
- wherein R is a side chain for mobility tuning; or

(11) a compound of formula XI:



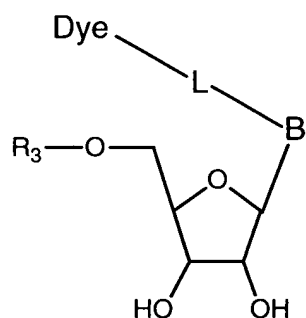
- wherein B is a nucleobase selected from uracil, cytosine, adenine, 7-deazaadenine, guanine, and 7-deazaguanine;
- wherein R<sub>3</sub> is triphosphate or a salt thereof;
- wherein L is a linker selected from propargyl-ethyl-oxide-amino and propargylamino wherein the linker is attached to the 8-C of a adenine, 7-deazaadenine, guanine, or 7-deazaguanine nucleobase, the 7-C or 8-C of a 7-deazaadenine or 7-deazaguanine nucleobase, or the C-5 of a uracil or cytosine nucleobase; and
- wherein Dye is selected from a rhodamine dye and a fluorescein dye.

128. (previously presented) The method according to claim 108, wherein the reporter group is a rhodamine-type dye, a fluorescein-type dye, an energy transfer dye, or a cyanine-type dye.

129. (previously presented) The method according to claim 108, further comprising separating the fragments that contain at least one primer from other fragments.

130. (previously presented) A method for determining a polynucleotide sequence, comprising

- (i) annealing at least one primer to a template polynucleotide;
- (ii) extending said at least one primer in the presence of a mixture of unlabeled dNTPs and at least one dye-labeled ribonucleotide having the formula:



wherein B is a nucleobase; L is a linker; R<sub>3</sub> is triphosphate,  $\alpha$ -thiotriphosphate, or a salt thereof, and Dye is a reporter group;

wherein at least one of the unlabeled dNTPs comprises a nucleobase that is the same as the nucleobase of at least one of the at least one dye-labeled ribonucleotide;

so that primer extension products that contain at least one dye-labeled ribonucleotide are formed;

(iii) cleaving one or more primer extension products to form a plurality of labeled fragments;

(iv) separating the extension products by size; and

(v) detecting the fragments to determine the polynucleotide sequence.

131. (previously presented) The method according to claim 130, wherein the dye-labeled ribonucleotides are rATP-PA-6R6G, rCTP-PA-Rox, rUTP-PA-Tamra and rGTP-EO-R110.

132. (previously presented) The method according to claim 130, wherein one primer is biotinylated.

133. (previously presented) The method according to claim 130, wherein at least one primer is a hybridization based pull-out primer.

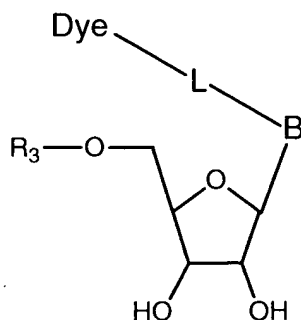
134. (previously presented) The method according to claim 130, wherein the DNA polymerase is a thermostable DNA polymerase.

135. (previously presented) The method according to claim 134, wherein the thermostable DNA polymerase is a modified thermostable DNA polymerase having increased efficiency for the incorporation of ribonucleotides.

136. (previously presented) The method according to claim 130, wherein said one or more primer extension products are cleaved at each occurrence of a ribonucleotide by alkali treatment, heat treatment, or a ribonuclease.

137. (previously presented) A method for detecting mutations in a polynucleotide, comprising

- annealing two primers to a template polynucleotide;
- extending the two primers in the presence of a mixture of unlabeled dNTPs and at least one dye-labeled ribonucleotide having the formula:



wherein B is a nucleobase; L is a linker; R<sub>3</sub> is triphosphate, α-thiotriphosphate, or a salt thereof, and Dye is a reporter group;

wherein at least one of the unlabeled dNTPs comprises a nucleobase that is the same as the nucleobase of at least one of the at least one dye-labeled ribonucleotide;

so that primer extension products that contain at least one dye-labeled ribonucleotide are formed;

- cleaving one or more primer extension products to form a plurality of labeled fragments;
- separating the fragments by size; and
- detecting the fragments to detect the mutations.

138. (previously presented) The method according to claim 137, wherein the fragments that contain primers are separated from other fragments before the fragments that contain primers are separated by size.

139. (previously presented) The method according to claim 137, wherein the mutation is a single nucleotide polymorphism.

140. (previously presented) The method according to claim 137, wherein the polynucleotide is genomic DNA.

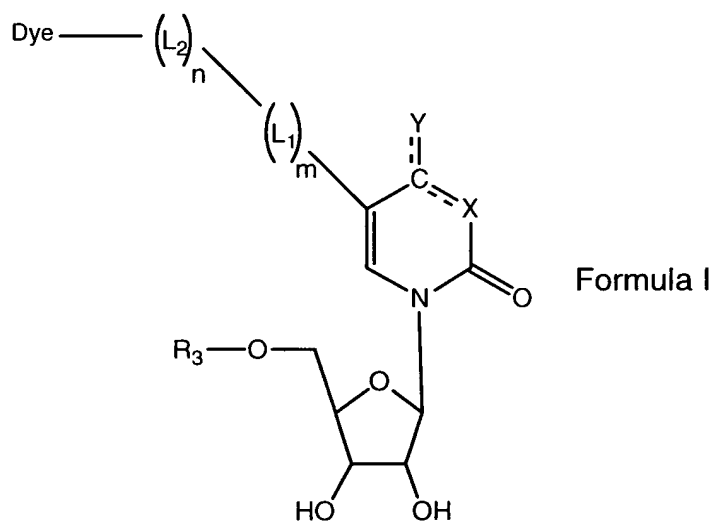
141. (previously presented) The method according to claim 137, wherein at least one primer is biotinylated.

142. (currently amended) The method according to claim 137, wherein at least one primer is a hybridization based pull-out primer.

143. (previously presented) The method according to claim 137, wherein one primer comprises a modified base preventing primer extension in the 5' direction.

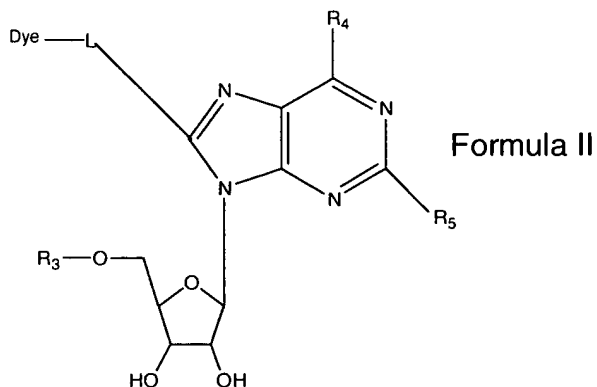
144. (previously presented) The method according to claim 130, wherein said at least one dye-labeled ribonucleotide is:

(1) a compound of formula I:



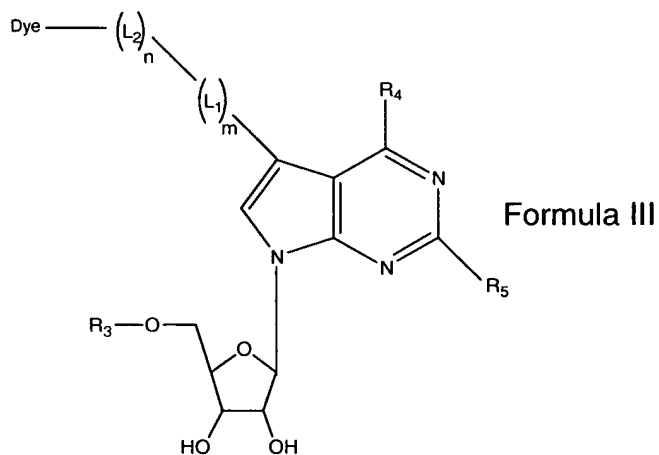
- wherein X is N, NH, or C;
- wherein Y is O or NH<sub>2</sub>;
- wherein R<sub>3</sub> is either triphosphate, α-thiotriphosphate, or a salt thereof;
- wherein L<sub>1</sub> is a linker;
- wherein L<sub>2</sub> is a benzylamine linker or a phosphate linker;
- wherein n = 0-4, m = 0-4, and m + n is at least 1; and
- wherein the dye is any reporter group;

(2) a compound of formula II:



- wherein L is a linker;
- wherein  $R_4$  is either  $\text{NH}_2$ , OH, or O, and  $R_5$  is either  $\text{NH}_2$ , OH, or H;
- wherein  $R_3$  is either triphosphate,  $\alpha$ -thiotriphosphate, or a salt thereof;  
and
- wherein the dye is any reporter group;

(3) a compound of formula III:



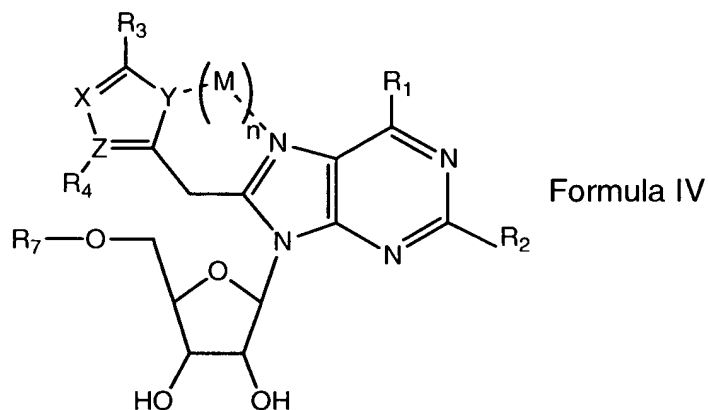
- wherein  $L_1$  is a linker;
- wherein  $L_2$  is a benzylamine linker or a phosphate linker;
- wherein  $n = 0-4$ ,  $m = 0-4$ , and  $m + n$  is at least 1;
- wherein  $R_4$  is either  $\text{NH}_2$ , OH, or O, and  $R_5$  is either  $\text{NH}_2$ , OH, or H;



- wherein  $R_3$  is either triphosphate,  $\alpha$ -thiotriphosphate, or a salt thereof;  
and

- wherein the dye is any reporter group;

(4) a compound of formula IV:



Formula IV

- wherein  $R_1$ ,  $R_2$ , and  $R_4$  are independently H, O, OR, S, SR,  $NR_2$  or  $CR_2$ ;

- wherein  $R_3$  is SR,  $NR_2$ , OR, or  $CR_2$  and comprises a reporter group;

- wherein R is hydrogen, alkyl, aryl, or an amino acid;

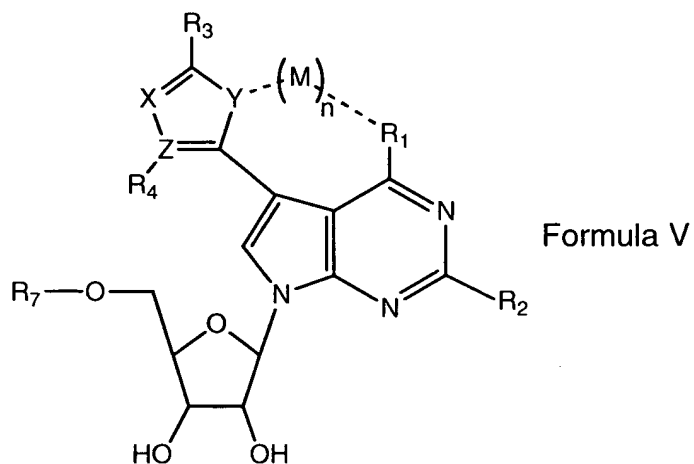
- wherein  $R_7$  is either triphosphate,  $\alpha$ -thiotriphosphate, or a salt thereof;

- wherein X, Y, and Z are independently carbon, nitrogen, oxygen, sulfur,  
phosphorus, or selenium;

- wherein n is 0 or 1; and

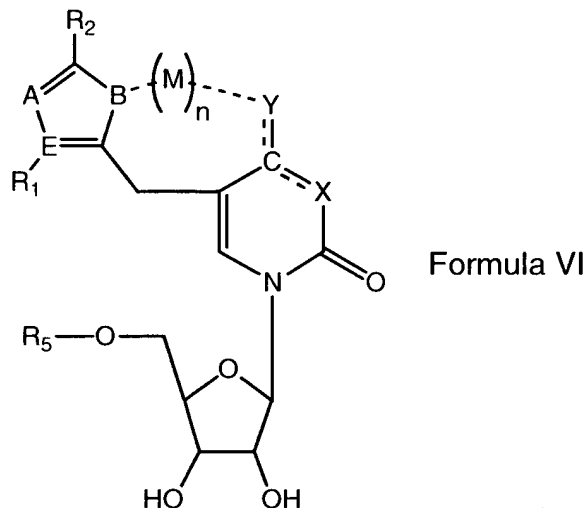
- wherein M is  $H_2O$  or any metal;

(5) a compound of formula V:



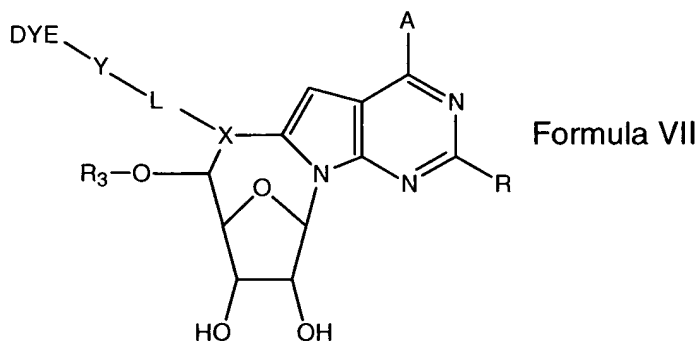
- wherein  $R_1$ ,  $R_2$ , and  $R_4$  are independently H, O, OR, S, SR,  $NR_2$  or  $CR_2$ ;
- wherein  $R_3$  is SR,  $NR_2$ , OR, or  $CR_2$  and comprises a reporter group;
- wherein R is hydrogen, alkyl, aryl, or an amino acid;
- wherein  $R_7$  is either triphosphate,  $\alpha$ -thiotriphosphate, or a salt thereof;
- wherein X, Y, and Z are independently carbon, nitrogen, oxygen, sulfur, phosphorus, or selenium;
- wherein n is 0 or 1; and
- wherein M is  $H_2O$  or any metal;

(6) a compound of formula VI:



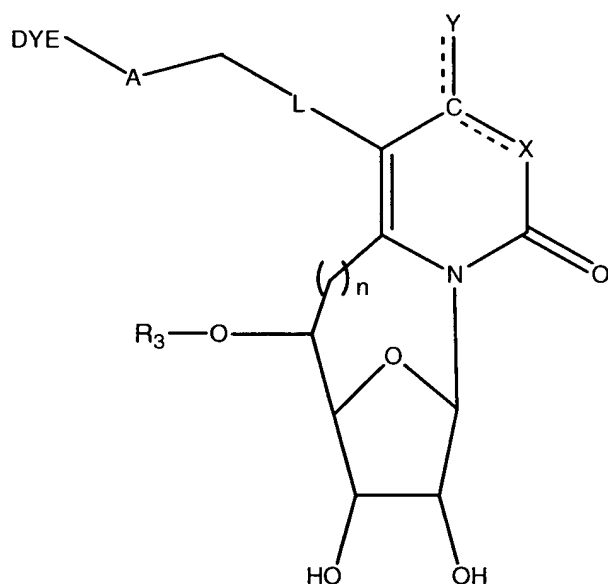
- wherein  $R_1$  is H, O, OR, S, SR,  $NR_2$ , or  $CR_2$ ,
- wherein  $R_2$  is SR,  $NR_2$ , OR, or  $CR_2$  and comprises a reporter group;
- wherein R is hydrogen, alkyl, alkynyl, aryl, or an amino acid;
- wherein  $R_5$  is either triphosphate,  $\alpha$ -thiotriphosphate, or a salt thereof;
- wherein X is N, NH, or C;
- wherein Y is O or  $NH_2$ ;
- wherein A, B, and E are independently C, N, O, S, P, or Se;
- wherein n is 0 or 1; and
- wherein M is  $H_2O$  or any metal;

(7) a compound of formula VII:



- wherein A is NH<sub>2</sub>, OH, or O;
- wherein R is H, O, NR'<sub>2</sub>, S, CR'<sub>2</sub>, or halide;
- wherein R' is hydrogen or alkyl;
- wherein R<sub>3</sub> is either triphosphate, α-thiotriphosphate, or a salt thereof;
- wherein L is alkyl;
- wherein X is CR or N and Y is O, S, or NH; and
- wherein the dye is any reporter group;

(8) a compound of formula VIII:

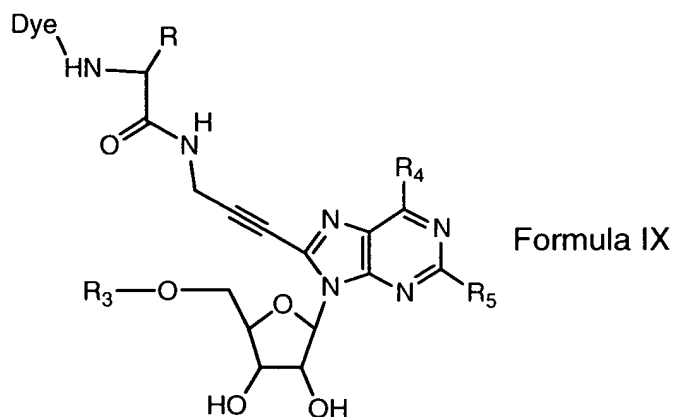


Formula VIII

- wherein X is N, NH, or C;
- wherein Y is O or NH<sub>2</sub>;
- wherein R<sub>3</sub> is either triphosphate, α-thiotriphosphate; or a salt thereof;
- wherein A is O, S, or NH;
- wherein L is alkyl or aryl substituted at from 0 to 3 positions in a chemically reasonable manner with F, Cl, Br, I, C1-C18 alkyl, Silyl, OH, OR', SH, SR', SOR', SO<sub>2</sub>R', SO<sub>3</sub>, or NR'<sub>2</sub>;
- wherein R' is hydrogen or alkyl;

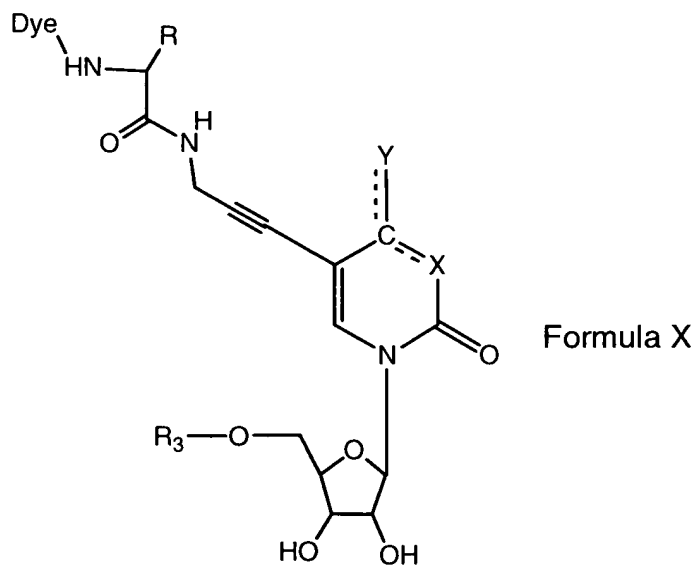
- wherein n is 1 to 10; and
- wherein the dye is any reporter group;

(9) a compound of formula IX:



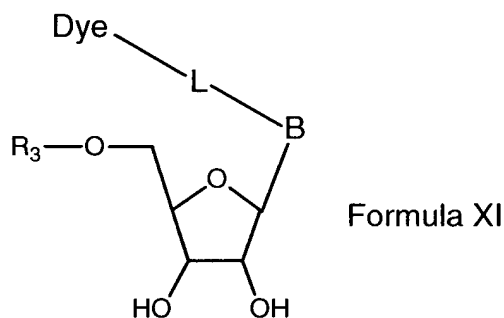
- wherein R<sub>4</sub> is NH<sub>2</sub>, OH, or O and R<sub>5</sub> is NH<sub>2</sub>, OH, or H, provided that if A is NH<sub>2</sub>, B is H and if A is O, B is NH<sub>2</sub>;
- wherein R<sub>3</sub> is either triphosphate, α-thiotriphosphate, or a salt thereof;
- wherein the dye is any reporter group; and
- wherein R is a side chain for mobility tuning;

(10) a compound of formula X:



- wherein X is N, NH, or C;
- wherein Y is O or NH<sub>2</sub>;
- wherein R<sub>3</sub> is either triphosphate, α-thiotriphosphate, or a salt thereof;
- wherein Dye is any reporter group, and
- wherein R is a side chain for mobility tuning; or

(11) a compound of formula XI:



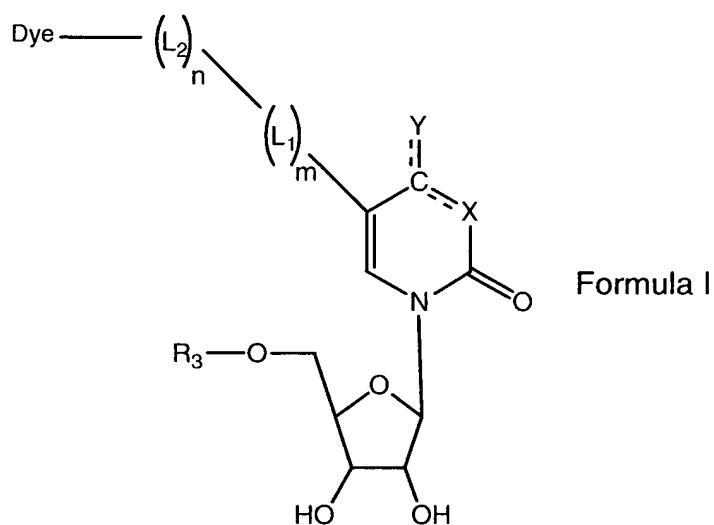
- wherein B is a nucleobase selected from uracil, cytosine, adenine, 7-deazaadenine, guanine, and 7-deazaguanine;
- wherein R<sub>3</sub> is triphosphate or a salt thereof;
- wherein L is a linker selected from propargyl-ethyl-oxide-amino and propargylamino wherein the linker is attached to the 8-C of a adenine, 7-deazaadenine, guanine, or 7-deazaguanine nucleobase, the 7-C or 8-C of a 7-deazaadenine or 7-deazaguanine nucleobase, or the C-5 of a uracil or cytosine nucleobase; and
- wherein Dye is selected from a rhodamine dye and a fluorescein dye.

145. (previously presented) The method according to claim 130, wherein the reporter group is a rhodamine-type dye, a fluorescein-type dye, an energy transfer dye, or a cyanine-type dye.

146. (previously presented) The method according to claim 130, further comprising separating the fragments that contain at least one primer from other fragments.

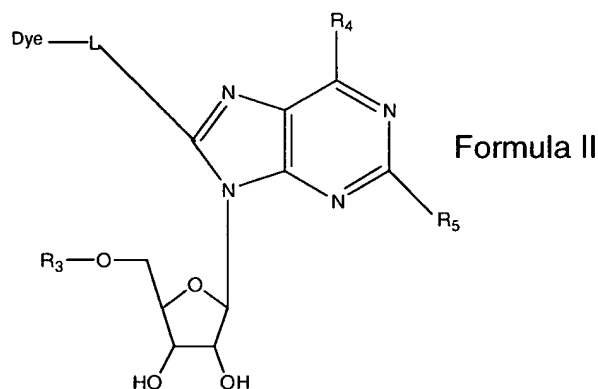
least one dye-labeled ribonucleotide is:

(1) a compound of formula I:



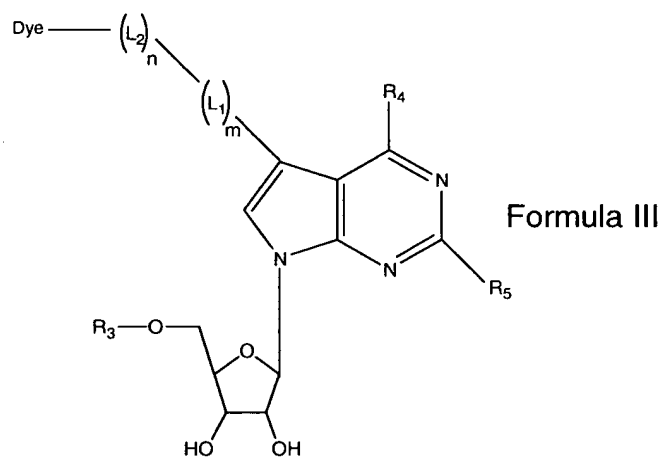
- wherein X is N, NH, or C;
- wherein Y is O or NH<sub>2</sub>;
- wherein R<sub>3</sub> is either triphosphate, α-thiotriphosphate, or a salt thereof;
- wherein L<sub>1</sub> is a linker;
- wherein L<sub>2</sub> is a benzylamine linker or a phosphate linker;
- wherein n = 0-4, m = 0-4, and m + n is at least 1; and
- wherein the dye is any reporter group;

(2) a compound of formula II:



- wherein L is a linker;
- wherein R<sub>4</sub> is either NH<sub>2</sub>, OH, or O, and B is either NH<sub>2</sub>, OH, or H;
- wherein R<sub>3</sub> is either triphosphate, α-thiotriphosphate, or a salt thereof;  
and
- wherein the dye is any reporter group;

(3) a compound of formula III:



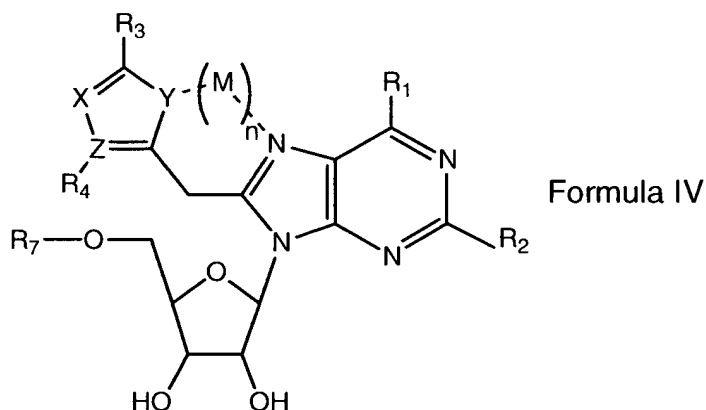
- wherein L<sub>1</sub> is a linker;
- wherein L<sub>2</sub> is a benzylamine linker or a phosphate linker;
- wherein n = 0-4, m = 0-4, and m + n is at least 1;
- wherein R<sub>4</sub> is either NH<sub>2</sub>, OH, or O, and R<sub>5</sub> is either NH<sub>2</sub>, OH, or H;



- wherein  $R_3$  is either triphosphate,  $\alpha$ -thiotriphosphate, or a salt thereof;  
and

- wherein the dye is any reporter group;

(4) a compound of formula IV:



Formula IV

- wherein  $R_1$ ,  $R_2$ , and  $R_4$  are independently H, O, OR, S, SR,  $NR_2$  or  $CR_2$ ;

- wherein  $R_3$  is SR,  $NR_2$ , OR, or  $CR_2$  and comprises a reporter group;

- wherein R is hydrogen, alkyl, aryl, or an amino acid;

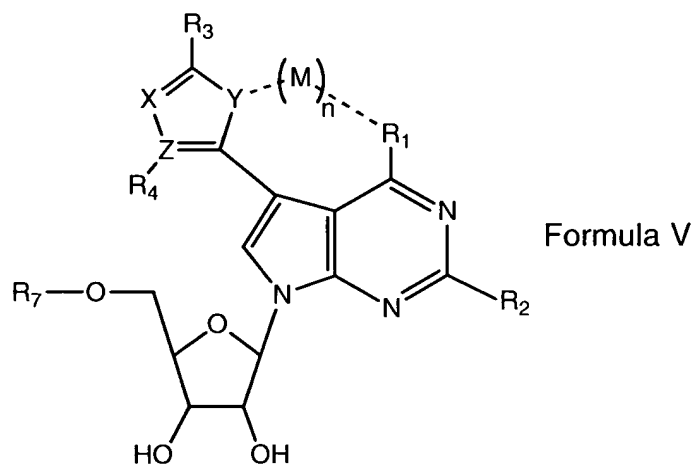
- wherein  $R_7$  is either triphosphate,  $\alpha$ -thiotriphosphate, or a salt thereof;

- wherein X, Y, and Z are independently carbon, nitrogen, oxygen, sulfur,  
phosphorus, or selenium;

- wherein n is 0 or 1; and

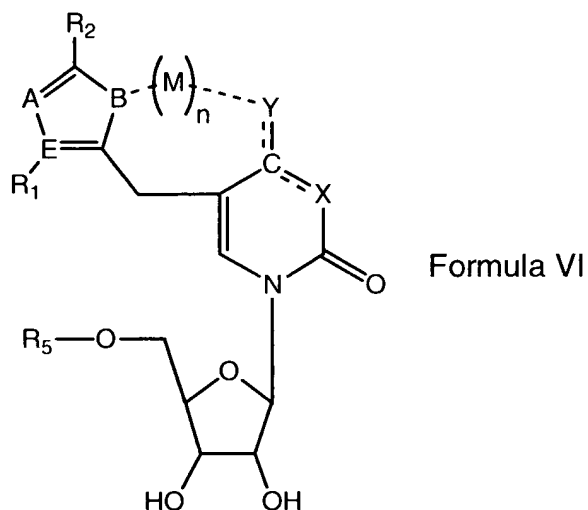
- wherein M is  $H_2O$  or any metal;

(5) a compound of formula V:



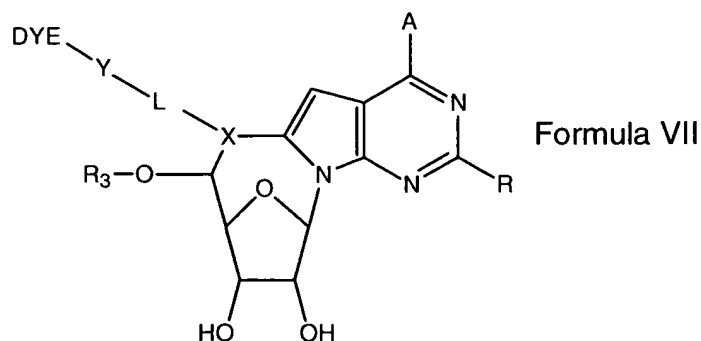
- wherein  $R_1$ ,  $R_2$ , and  $R_4$  are independently H, O, OR, S, SR,  $NR_2$  or  $CR_2$ ;
- wherein  $R_3$  is SR,  $NR_2$ , OR, or  $CR_2$  and comprises a reporter group;
- wherein R is hydrogen, alkyl, aryl, or an amino acid;
- wherein  $R_7$  is either triphosphate,  $\alpha$ -thiotriphosphate, or a salt thereof;
- wherein X, Y, and Z are independently carbon, nitrogen, oxygen, sulfur, phosphorus, or selenium;
- wherein n is 0 or 1; and
- wherein M is  $H_2O$  or any metal;

(6) a compound of formula VI:



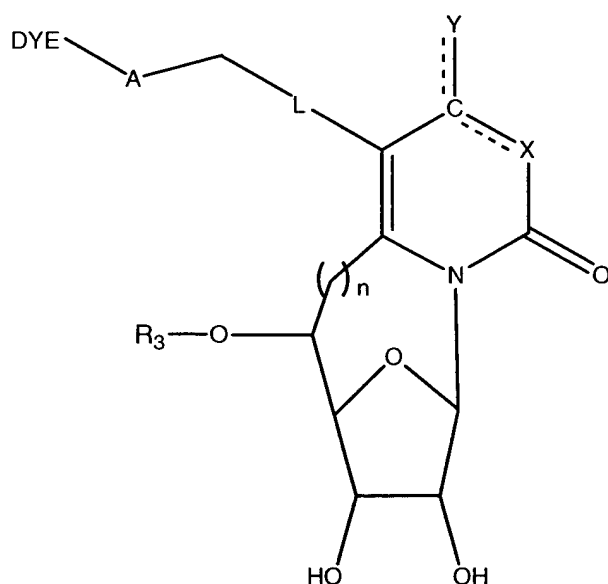
- wherein  $R_1$  is H, O, OR, S, SR,  $NR_2$ , or  $CR_2$ ,
- wherein  $R_2$  is SR,  $NR_2$ , OR, or  $CR_2$  and comprises a reporter group;
- wherein R is hydrogen, alkyl, alkynyl, aryl, or an amino acid;
- wherein  $R_5$  is either triphosphate,  $\alpha$ -thiotriphosphate, or a salt thereof;
- wherein X is N, NH, or C;
- wherein Y is O or  $NH_2$ ;
- wherein A, B, and E are independently C, N, O, S, P, or Se;
- wherein n is 0 or 1; and
- wherein M is  $H_2O$  or any metal;

(7) a compound of formula VII:



- wherein A is  $\text{NH}_2$ , OH, or O;
- wherein R is H, O,  $\text{NR}'_2$ , S,  $\text{CR}'_2$ , or halide;
- wherein R' is hydrogen or alkyl;
- wherein  $\text{R}_3$  is either triphosphate,  $\alpha$ -thiotriphosphate, or a salt thereof;
- wherein L is alkyl;
- wherein X is CR or N and Y is O, S, or NH; and
- wherein the dye is any reporter group;

(8) a compound of formula VIII:

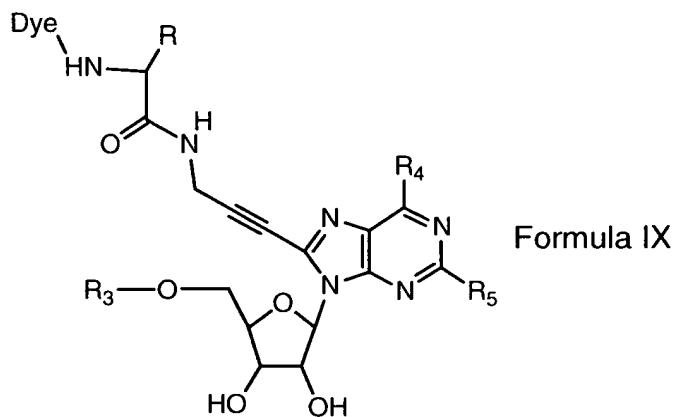


Formula VIII

- wherein X is N, NH, or C;
- wherein Y is O or  $\text{NH}_2$ ;
- wherein  $\text{R}_3$  is either triphosphate,  $\alpha$ -thiotriphosphate, or a salt thereof;
- wherein A is O, S, or NH;
- wherein L is alkyl or aryl substituted from 0 to 3 positions in a chemically reasonable manner with F, Cl, Br, I, C1-C18 alkyl, Silyl, OH,  $\text{OR}'$ , SH,  $\text{SR}'$ ,  $\text{SOR}'$ ,  $\text{SO}_2\text{R}'$ ,  $\text{SO}_3$ , or  $\text{NR}'_2$ ;
- wherein R' is hydrogen or alkyl;

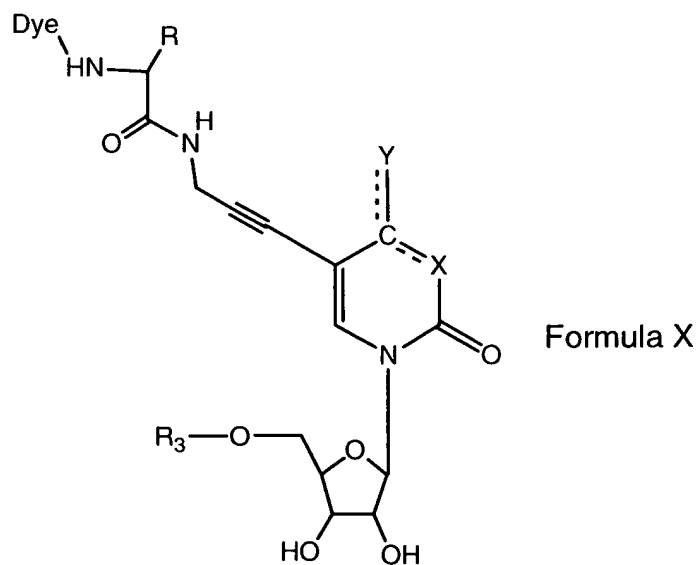
- wherein n is 1 to 10; and
- wherein the dye is any reporter group;

(9) a compound of formula IX:



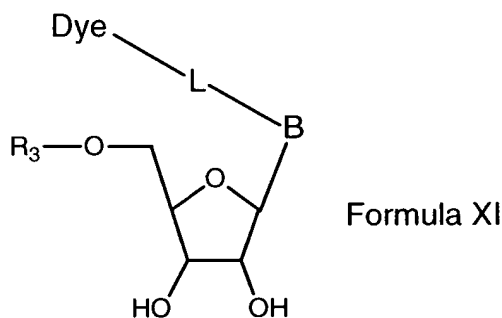
- wherein R<sub>4</sub> is NH<sub>2</sub>, OH, or O and R<sub>5</sub> is NH<sub>2</sub>, OH, or H, provided that if A is NH<sub>2</sub>, B is H and if A is O, B is NH<sub>2</sub>;
- wherein R<sub>3</sub> is either triphosphate, α-thiotriphosphate, or a salt thereof;
- wherein the dye is any reporter group; and
- wherein R is a side chain for mobility tuning;

(10) a compound of formula X:



- wherein X is N, NH, or C;
- wherein Y is O or NH<sub>2</sub>;
- wherein R<sub>3</sub> is either triphosphate, α-thiotriphosphate, or a salt thereof;
- wherein Dye is any reporter group, and
- wherein R is a side chain for mobility tuning; or

(11) a compound of formula XI:



- wherein B is a nucleobase selected from uracil, cytosine, adenine, 7-deazaadenine, guanine, and 7-deazaguanine;
- wherein R<sub>3</sub> is triphosphate or a salt thereof;
- wherein L is a linker selected from propargyl-ethyl-oxide-amino and propargylamino wherein the linker is attached to the 8-C of a adenine, 7-deazaadenine, guanine, or 7-deazaguanine nucleobase, the 7-C or 8-C of a 7-deazaadenine or 7-deazaguanine nucleobase, or the C-5 of a uracil or cytosine nucleobase; and
- wherein Dye is selected from a rhodamine dye and a fluorescein dye.

148. (previously presented) The method according to claim 137, wherein the reporter group is a rhodamine-type dye, a fluorescein-type dye, an energy transfer dye, or a cyanine-type dye.

149. (previously presented) The method according to claim 137, further comprising separating the fragments that contain at least one primer from other fragments.